# New species of coelotine spiders (Araneae, Amaurobiidae) from northern Thailand I 

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> New species of coelotine spiders (Araneae, Amaurobiidae) from northern Thailand I. - Six new coelotine spider species are described from Chiang Mai and Chiang Rai Provinces, northern Thailand: Draconarius abbreviatus sp. n., D. anthonyi sp. n., D. inthanonensis sp. n., D. siamensis sp. n., D. subulatus sp. n. and Coelotes thailandensis sp. n. The specific name Coelotes wangi Hu, 2001, from Tibet, China, is a junior homonym of Coelotes wangi Chen \& Zhao, 1997 and is here replaced by Coelotes hui nom. n.

Key-words: Araneae - Amaurobiidae - Coelotinae - Draconarius - Coelotes - new species - taxonomy - zoogeography- Thailand.

## INTRODUCTION

The northern part of Thailand is essentially a series of mountainous ridges folded between two offshoots of the Himalayan Range: the Dawna-Tenasserim and the Annamitic Chain. This region makes up approximately 20 percent of the country's land area and is dotted with many mountains higher than 1500 m , where coelotine spiders are abundant.

The spider family Amaurobiidae is represented by 67 genera and 590 described species (Platnick, 2003) from around the world. Most species occurring in Asia were described from China, and only few species were recorded from tropical regions south of it. There is no record of any amaurobiids from Thailand, though coelotine spiders are fairly common in evergreen hill forests in the north of the country.

Several coelotine spiders examined in this study were collected by Dr Peter J. Schwendinger (MHNG) during the 1980s and 1990s. Additional specimens examined were obtained in the cause of an ecological project conducted in the Doi Inthanon National Park by the first author. New coelotine species described in this paper were collected only from the mountains of the Dawna-Tenasserim Range (Doi Inthanon, Doi Suthep-Pui, Doi Lanka). Additional species from other parts of the country will be described in subsequent papers.

## MATERIAL AND METHODS

All illustrations were made with an Olympus SZX-9 stereomicroscope equipped with a drawing tube. Body measurements are in millimetres. Measurements of leg segments were taken from the dorsal side. Epigyna were drawn in natural and cleared state (immersing in lactic acid for 10-20 minutes). Male palps were drawn in lateral and ventral view. The material examined is deposited in the collections of the Muséum d'histoire naturelle, Genève (MHNG) and of the Department of Entomology at the California Academy of Sciences (CAS), except for the specimens marked with PDC (Pakawin Dankittipakul Collection, Auckland, New Zealand), which will later also be deposited in the MHNG.

Abbreviations used in the text and in the figures: ALE, anterior lateral eyes; AME, anterior median eyes; $C$, conductor; $C D$, copulatory duct; CL, conductor lamella; DC, dorsal apophysis of conductor (= conductor dorsal apophysis according to Wang, 2002); E, embolus; LE, lateral eyes; MA, median apophysis; ME, median eyes; MOQ, median ocular quadrangle; PA, patellar apophysis; PLE, posterior lateral eyes; PME, posterior median eyes; RDTA, retrolateral dorsal tibial apophysis (= lateral tibial apophysis according to Wang, 2002); RTA, retrolateral tibial apophysis; SH, spermathecal head; SS, spermathecal stalk.

## TAXONOMY

Draconarius Ovtchinnikov, 1999
Diagnosis: The genus Draconarius resembles Asiacoelotes Wang, 2002 in possessing an elongated lateral cymbial furrow, a long, slender embolus and a long, strongly convoluted spermathecae. Males can be distinguished by the presence of a dorsal apophysis on the conductor (Fig. 2). Females can be distinguished by posteriorly originating copulatory ducts and widely separated spermathecae (Fig. 4).

Draconarius abbreviatus sp. n .
Figs 1-4
Type locality: THAILAND, Chiang Mai Province, Chomthong District, Doi Inthanon National Park, Doi Inthanon.

Type material: Holotype: ${ }^{\circ}$, from the type locality, pine forest, 1000 m , pitfall trap, 25.xii.1999-29.i.2000, leg. P. Dankittipakul (MHNG). Paratypes (all from the type locality): 1 ㅇ, pine forest, 1000 m , litter sample, $15 . \mathrm{iv} .2000$ (MHNG); $2 \mathbf{c}^{\circ}, 1000 \mathrm{~m}$, pitfall trap, 25.xii.1999-29.i.2000, leg. P. Dankittipakul (MHNG); 2 ${ }^{\text {ot }}$, pine forest, 1000 m , pitfall trap, 29.i-26.ii.2000, leg. P. Dankittipakul (CAS); $1 \delta^{\star}$, evergreen hill forest, 1750 m , litter sample, 15.i.2000, leg. P. Dankittipakul (PDC AM00154).

Etymology: The specific name refers to the short retrolateral tibial apophysis of the male palp.

Diagnosis: Males are similar to those of D. everesti (Hu, 2001) but can be distinguished by the elongated median apophysis of the palpal organ and by differences in their conductors. Females are smilar to those of D. lutulentus (Wang et al., 1990) but can be distinguished by the small copulatory ducts of the epigynum.

Description: ơ (holotype). Total length 8.49. Carapace 4.85 long, 3.33 wide. Abdomen 3.64 long. Promargin of chelicerae with 3 teeth, retromargin with 5. Labium longer than wide ( $0.54 / 0.50$ ).


Figs 1-4
Draconarius abbreviatus sp. n., ot holotype (1, 2), \& paratype (3, 4). Left palp, ventral (1) and retrolateral (2) view. Epigynum, ventral view (3). Vulva, dorsal view (4). Scale lines 0.5 mm (12), $0.25 \mathrm{~mm}(3-4)$. Abbreviations: C, conductor; CD, copulatory duct; CL, conductor lamella; DC, dorsal apophysis of conductor; E, embolus; MA, median apophysis; PA, patella apophysis; RDTA, retrolateral dorsal tibial apophysis; RTA, retrolateral tibial apophysis; SH, spermathecal head; SS, spermathecal stalk.

Eye sizes and interdistances: AME 0.15 , ALE 0.18, PME 0.16, PLE 0.18; AMEAME 0.13, AME-ALE 0.07, PME-PME 0.15, PME-PLE 0.20, ALE-PLE 0.07; MOQ 0.48 long, anterior width 0.41 , posterior width 0.48 . Clypeus height 0.23 . Leg formula: 1-4-2-3.

Leg measurements:

|  | I | II | III | IV |
| :--- | ---: | :---: | ---: | ---: |
| Femur | 4.04 | 3.54 | 3.23 | 3.94 |
| Patella + Tibia | 5.15 | 4.34 | 3.74 | 5.05 |
| Metatarsus | 3.94 | 3.33 | 3.13 | 4.14 |
| Tarsus | 2.02 | 1.82 | 1.52 | 1.92 |
| Total | 15.15 | 13.03 | 11.62 | 15.05 |

Palp (Figs 1-2): Patellar apophysis long, with sharply pointed apex; retrolateral tibial apophysis short, less than half of tibial length; retrolateral dorsal tibial apophysis small, close to retrolateral tibial apophysis; cymbial furrow short; conductor short; conductor lamella medium-sized; dorsal apophysis of conductor large; median apophysis spoon-shaped, elongated; embolus originating proximally.

I (paratype). Total length 9.10. Carapace 4.55 long, 3.13 wide. Abdomen 3.54 long. Promargin of chelicerae with 3 teeth, retromargin with 5 .

Eye sizes and interdistances: AME 0.10, ALE 0.15, PME 0.15, PLE 0.16; AME-AME 0.13, AME-ALE 0.07, PME-PME 0.15, PME-PLE 0.18, ALE-PLE 0.07 ; MOQ 0.46 long, anterior width 0.35 , posterior width 0.46 . Clypeus height 0.22 . Leg formula: 4-1-2-3.

Leg measurements:

|  | I | II | III | IV |
| :--- | ---: | ---: | ---: | ---: |
| Femur | 3.33 | 3.03 | 2.73 | 3.54 |
| Patella + Tibia | 4.24 | 3.54 | 3.03 | 4.04 |
| Metatarsus | 3.03 | 2.63 | 2.22 | 3.33 |
| Tarsus | 1.51 | 1.31 | 1.11 | 1.62 |
| Total | 12.11 | 10.71 | 9.09 | 12.53 |

Epigynum and vulva (Figs 3-4): Epigynal teeth short, close to atrial margin; atrium small; copulatory ducts small, extended mesad of spermathecae; spermathecal heads situated anteriorly; spermathecal bases broad, widely separated; spermathecal stalks broad, anteriorly converging.

Distribution and habitat: Known only from the type locality. Most specimens were collected from pine forest at 1000 m elevation; one male was collected from leaf litter of evergreen hill forest (at 1750 m ).

Draconarius anthonyi sp. n.
Figs 5-8
Type locality: THAILAND, Chiang Mai Province and District, Doi Suthep-Pui National Park, Doi Pui.

Type material: Holotype: ${ }^{\hat{N}}$, at $1500 \mathrm{~m}, 15 . v i i i .1987$, leg. P. J. Schwendinger (MHNG). Paratypes: $2 \delta, 1$ 우 , data as holotype (MHNG); $\delta, 1680 \mathrm{~m}, 27 . i .2001$, leg. P. Dankittipakul (MHNG); $1 \delta^{\delta}, 1610 \mathrm{~m}, 19 . \mathrm{ix} .1993$, leg. P. J. Schwendinger (PDC AM0080); $4 \delta^{\circ}, 3$ ¢, $1500-$
$1600 \mathrm{~m}, 27 . \mathrm{ix} .1990$, leg. P. J. Schwendinger (CAS); 30才, 2 ㅇ, 1500-1600 m, 27.ix.1990, leg. P. J. Schwendinger (MHNG).

Etymology: The specific name is a patronym dedicated to Anthony Osa, Auckland, New Zealand.

Diagnosis: Males of $D$. anthonyi sp. n. are similar to those of D. argenteus (Wang et al., 1990) but can be distinguished by their broader conductor and by differences of their embolus and embolic base. Females of this species are similar to those of $D$. lutulentus but can be distinguished by the broader spermathecae.

Description: ơ (holotype). Total length 10.61 . Carapace 4.95 long, 3.23 wide. Abdomen 5.15 long. Promargin of chelicerae with 3 teeth, retromargin with 5.

Eye sizes and interdistances: AME 0.18, ALE 0.20, PME 0.16, PLE 0.20; AME-AME 0.13 , AME-ALE 0.10 , PME-PME 0.19 , PME-PLE 0.25 , ALE-PLE 0.07 ; MOQ 0.58 long, anterior width 0.51 , posterior width 0.53 . Clypeus height 0.23 . Leg formula: 1-4-2-3.

Leg measurements:

|  | I | II | III | IV |
| :--- | ---: | ---: | ---: | ---: |
| Femur | 4.44 | 4.04 | 3.64 | 4.34 |
| Patella + Tibia | 5.76 | 5.05 | 2.73 | 5.56 |
| Metatarsus | 4.55 | 4.04 | 3.84 | 5.05 |
| Tarsus | 4.24 | 2.12 | 1.72 | 2.02 |
| Total | 17.17 | 15.25 | 11.93 | 16.97 |

Palp (Figs 5, 6): Palp without patellar apophysis; retrolateral tibial apophysis short, approximately half of tibial length; retrolateral dorsal tibial apophysis small, close to retrolateral tibial apophysis; cymbial furrow about half of cymbial length; conductor short; conductor lamella medium-sized; dorsal apophysis of conductor large; median apophysis spoon-shaped, elongated; embolus originating proximally.
\& (paratype). Total length 10.10 . Carapace 4.75 long, 3.23 wide. Abdomen 5.15 long. Promargin of chelicerae with 3 teeth, retromargin with 5, occasionally 6. Labium slightly longer than wide $(0.87 / 0.76)$.

Eye sizes and interdistances: AME 0.18, ALE 0.23, PME 0.19, PLE 0.20; AMEAME 0.11, AME-ALE 0.76, PME-PME 0.20, PME-PLE 0.25, ALE-PLE 0.10; MOQ 0.56 long, anterior width 0.51 , posterior width 0.56 . Clypeus height 0.23 . Leg formula: 4-1-2-3.

Leg measurements:

|  | I | II | III | IV |
| :--- | ---: | ---: | ---: | ---: |
| Femur | 3.54 | 3.33 | 3.03 | 4.04 |
| Patella + Tibia | 4.54 | 4.04 | 3.54 | 4.75 |
| Metatarsus | 3.43 | 2.93 | 2.73 | 3.64 |
| Tarsus | 1.71 | 1.52 | 1.41 | 1.52 |
| Total | 13.22 | 11.82 | 10.71 | 13.95 |

Epigynum and vulva (Figs 7-8): Epigynal teeth widely separated, situated anterior to atrium; atrium small, situated posteriorly near epigastric furrow; copulatory ducts originating posteriorly, looped around spermathecae; spermathecal heads small,


Figs 5－8
Draconarius anthonyi sp．n．，ot holotype（5，6），아 paratype（7，8）．Left palp，ventral（5）and retrolateral（6）view．Epigynum，ventral view（7）．Vulva，dorsal view（8）．Scale lines 0.5 mm （5－6）， 0.25 mm （7－8）．Abbreviations：CD，copulatory duct；SH，spermathecal head；SS，sper－ mathecal stalk．
situated anteriorly；spermathecal bases broad，widely separated；spermathecal stalks long，convoluted，converging anteriorly．

Distribution and habitat：Known only from the type locality．D．anthonyi sp．n． can be found along road banks in evergreen hill forest．The spiders usually build tubular retreats occupying a hole in a road bank．Only few specimens were collected from funnels in crevices of trees．All specimens examined were collected in between 1500 m and 1680 m altitude．

Draconarius inthanonensis sp． n ．
Figs 9－14
Type locality：THAILAND，Chiang Mai Province，Chomthong District，Doi Inthanon National Park，Doi Inthanon．

Type material：Holotype：đै，from the type locality，Kew Mae Pan 2100 m，pitfall trap， 27．vi．－26．vii．2000，leg．P．Dankittipakul（MHNG）．Paratypes： 2 ㅇ， 1800 m ，leaf litter sample， 26．xi．2002，leg．P．Dankittipakul（MHNG）；2す，Kew Mae Pan， 2100 m ，pitfall trap，27．vi．－ 26．vii．2000，leg．P．Dankittipakul（MHNG）；1才， 2530 m ，pitfall trap，29．iii．－27．iv．2000，leg．P． Dankittipakul（CAS）； $10^{\hat{N}}, 1750 \mathrm{~m}$ ，leaf litter sample， $15 . \mathrm{vi} .2000$ ，leg．P．Dankittipakul（MHNG）； 4 むิ， 2300 m ，pitfall trap，27．xi．1986－14．i．1987，leg．P．J．Schwendinger（MHNG），PDC AM0041－ 0042）．

Etymology：The specific name refers to the type locality，Doi Inthanon（ 2565 m ），the highest mountain in Thailand．


Figs 9-14
Draconarius inthanonensis sp. n., đ holotype ( 9,10 ), ठ paratype ( 11,12 ), ㅇ paratype ( 13,14 ). Left palp, ventral (9) and retrolateral (10) view. Right palp, ventral (11) and retrolateral (12) view. Epigynum, ventral view (13). Vulva, dorsal view (14). Scale lines $0.5 \mathrm{~mm}(9-12), 0.25 \mathrm{~mm}$ (13-14).

Diagnosis: This new species is similar to D. siamensis sp. n. but can be distinguished by the presence of a simple, not spoon-shaped median apophysis on the male palp and by differences in the atrium and spermathecal tubes of female genitalia.
 Abdomen 3.54 long. Promargin of chelicerae with 2 teeth, retromargin with 2. Labium longer than wide $(0.56 / 0.51)$.

Eye sizes and interdistances: AME 0.08, ALE 0.18, PME 0.15, PLE 0.15; AMEAME 0.10, AME-ALE 0.10, PME-PME 0.08, PME-PLE 0.18, ALE-PLE 0.10; MOQ 0.43 long, anterior width 0.30 , posterior width 0.43 . Clypeus height 0.10 . Leg formula: 1-4-2-3.

Leg measurements:

|  | I | II | III | IV |
| :--- | :---: | :---: | :---: | ---: |
| Femur | 3.23 | 2.93 | 2.53 | 3.13 |
| Patella + Tibia | 4.24 | 3.54 | 2.82 | 3.94 |
| Metatarsus | 3.33 | 2.73 | 2.63 | 3.33 |
| Tarsus | 2.32 | 1.92 | 1.52 | 1.72 |
| Total | 13.12 | 11.12 | 9.50 | 12.12 |

Palp (Figs 9-12): Patellar apophysis very small; retrolateral tibial apophysis about half of tibial length; retrolateral dorsal tibial aophysis small; cymbial furrow approximately half of cymbial length; conductor short; dorsal apophysis of conductor small; conductor lamella medium-sized; median apophysis simple, weakly sclerotized, not spoon-shaped; embolus originating proximally.

I (paratype). Total length 10.91 . Carapace 4.65 long, 3.13 wide. Abdomen 6.01 long. Chericeral promargin with 2 teeth, retromargin with 2.

Eye sizes and interdistances: AME 0.15 , ALE 0.25 , PME 0.25 , PLE 0.20 ; AMEAME 0.13, AME-ALE 0.13, PME-PME 0.10, PME-PLE 0.25, ALE-PLE 0.13; MOQ 0.56 long, anterior width 0.46 , posterior width 0.58 . Clypeus height 0.13 . Leg formula: 4-1-2-3.

Leg measurements:

|  | I | II | III | IV |
| :--- | ---: | ---: | ---: | ---: |
| Femur | 3.64 | 3.33 | 2.83 | 3.84 |
| Patella + Tibia | 4.55 | 4.04 | 3.03 | 4.55 |
| Metatarsus | 3.33 | 2.63 | 2.52 | 3.74 |
| Tarsus | 2.02 | 1.62 | 1.41 | 1.61 |
| Total | 13.54 | 11.62 | 9.79 | 13.74 |

Epigynum and vulva (Figs 13-14): Epigynal teeth absent; epigynal hoods distinct; atrium small; copulatory ducts long, originating anteriorly, laterally extended and looped around spermathecae; spermathecal heads large, situated anteriorly; spermathecal bases small, widely separated; spermathecal stalks short, anteriorly converging.

Distribution and habitat: Known only from the type locality. D. inthanonensis sp . n . inhabits evergreen hill forest from about 1600 m elevation up to the summit ( 2560 m ) of the mountain.

## Draconarius siamensis sp．n．

Figs 15－20
Type locality：THAILAND，Chiang Mai Province，Chomthong District，Doi Inthanon National Park，Doi Inthanon．

Type material：Holotype：ठ̄， 2300 m ，pitfall trap，14．vii．－20．viii．1987，leg．P．J． Schwendinger（MHNG）．Paratypes： $2530 \mathrm{~m}, 1$ ㅇ，pitfall trap，16．ii．－18．iv．1987，leg．P．J． Schwendinger（MHNG）； $2530 \mathrm{~m}, 3 \mathrm{o}^{\boldsymbol{\beta}}$ ，pitfall trap，11．vi．－14．vii．1987，leg．P．J．Schwendinger （MHNG）； $2530 \mathrm{~m}, 1$ ¢，23．ii．1997，leg．P．J．Schwendinger（MHNG）； $2530 \mathrm{~m}, 2$ ，pitfall trap， 18．iv．－23．v．1987，leg．P．J．Schwendinger（MHNG）； $2530 \mathrm{~m}, 19$ ，pitfall trap，23．x．－17．xii．1986， leg．P．J．Schwendinger（MHNG）； $2530 \mathrm{~m}, 6{ }^{\hat{*}}$ ，pitfall trap，14．vii．－20．viii．1987，leg．P．J． Schwendinger（MHNG）； $2530 \mathrm{~m}, 1$ 大亏，pitfall trap，23．v．－11．vi．1987，leg．P．J．Schwendinger （PDC AM00120）； 2530 m ，4太̊，pitfall trap，20．viii．－8．x．1987，leg．P．J．Schwendinger（MHNG）； $2530 \mathrm{~m}, 1$ ㅇ，pitfall trap，17．xii．1986－16．ii．1987，leg．P．J．Schwendinger（MHNG）； $2530 \mathrm{~m}, 1$ 万， litter sample，8．vii．2002，leg．P．Dankittipakul（PDC AM0089）； 2530 m ， 1 た，pitfall trap，24．v．－ 27．vi．2000，leg．P．Dankittipakul（PDC AM0090）； $2530 \mathrm{~m}, 1$ 大ै，pitfall trap，28．viii－26．ix．1999， leg．P．Dankittipakul（PDC AM0091）； $2500 \mathrm{~m}, 1$ ¢，28．x．2000，leg．P．J．Schwendinger（MHNG TH－00／03）； $2500 \mathrm{~m}, 4$ \＆，pitfall trap，20．viii．－8．x．1987，leg．P．J．Schwendinger（PDC AM00121－ 00124）； $2300 \mathrm{~m}, 12$ oे $^{\circ}$ ，pitfall trap，14．vii．－20．viii．1987，leg．P．J．Schwendinger； $2300 \mathrm{~m}, 6 \hat{\sigma}^{\circ}$ ， 3 ㅇ，pitfall trap，11．vi．－14．vii．1987，leg．P．J．Schwendinger（CAS）； $2300 \mathrm{~m}, 80^{\text {ỡ }}, 19$ ，pitfall trap，20．viii．－8．x．1987，leg．P．J．Schwendinger（MHNG）； $2300 \mathrm{~m}, 2$ ， ，pitfall trap，27．xi．1986－ 14．i．1987，leg．P．J．Schwendinger（CAS）； $2100 \mathrm{~m}, 1 \delta^{i}$ ，pitfall trap，27．vi－26．vii．2000，leg．P． Dankittipakul（PDC AM0092）；Doi Inthanon， $2100 \mathrm{~m}, 2$ 웅 pitfall trap，27．viii－26．ix．2000，leg． P．Dankittipakul（PDC AM0093－0094）．

Other material examined：Doi Inthanon，Kew Mae Pan， 2100 m，2 $\delta^{\star}, 28 . v i i i .-26 . i x .2000$, leg．P．Dankittipakul：Specimens destroyed in preservative diluted by rainfall（only male palps and carapaces remaining）．

Etymology：Latin：siamensis，adjective of Siam，the former name of Thailand．
Diagnosis：This new species can be easily identified by：patellar apophysis small，retrolateral tibial apophysis short（less than half of tibial length），retrolateral tibial apophysis and retrolateral dorsal tibial apophysis situated close to each other in males；spermathecal bases large，widely separated and the spermathecal stalks short in females．

Description：ठ（holotype）．Total length 9．30．Carapace 4.54 long， 3.43 wide． Abdomen 4.44 long．Promargin of chelicerae with 3 teeth（two large and one small）， retromargin with 4 small teeth．Labium longer than wide（1．01／0．79）．

AME smallest．Eye sizes and interdistances：AME 0．10，ALE 0．19，PME 0．15， PLE 0．20；AME－AME 0．13，AME－ALE 0．10，PME－PME 0．15，PME－PLE 0．24，ALE－ PLE 0．10；MOQ 0.51 long，anterior width 0.35 ，posterior width 0.46 ．Clypeus height 0.20 ．

Leg measurements：

|  | I | II | III | IV |
| :--- | :---: | :---: | :---: | ---: |
| Femur | 3.93 | 3.64 | 3.23 | 4.04 |
| Patella＋Tibia | 5.05 | 4.14 | 3.54 | 4.85 |
| Metatarsus | 3.13 | 3.00 | 2.83 | 4.14 |
| Tarsus | 2.00 | 1.82 | 1.41 | 1.92 |
| Total | 14.11 | 12.6 | 11.01 | 14.95 |

Palp（Figs 15－17）：Patellar apophysis small；retrolateral tibial apophysis short， less than half of tibial length；retrolateral dorsal tibial apophysis small，situated close to retrolateral tibial apophysis；cymbial furrow short；conductor beak－like，short；

conductor lamella medium-sized; dorsal apophysis of conductor large; median apophysis spoon-shaped, elongated; embolus originating prolateral-proximally.

오 (paratype). Total length 13.43 . Carapace 5.45 long, 3.93 wide. Abdomen 7.38 long. Promargin of chelicerae with 3 teeth, retromargin with 5 . Labium longer than wide (1.15/0.89).

Eye sizes and interdistances: AME 0.13, ALE 0.20, PME 0.17, PLE 0.17; AMEAME 0.15, AME-ALE 0.15, PME-PME 0.20, PME-PLE 0.33, ALE-PLE 0.10 ; MOQ 0.54 long, anterior width 0.41 , posterior width 0.56 . Clypeus height 0.33 . Leg formula: 4-1-2-3.

Leg measurements:

|  | I | II | III | IV |
| :--- | ---: | ---: | ---: | ---: |
| Femur | 3.74 | 3.23 | 3.13 | 3.94 |
| Patella + Tibia | 5.05 | 4.04 | 3.53 | 4.65 |
| Metatarsus | 3.33 | 2.83 | 2.73 | 4.10 |
| Tarsus | 1.92 | 1.72 | 1.41 | 1.82 |
| Total | 14.04 | 11.82 | 10.8 | 14.51 |

Epigynum and vulva (Figs 18-20): Epigynal teeth short, situated lateral to atrium; atrium situated posteriorly, close to epigastric furrow; copulatory ducts situated mesal to spermathecae, anteriorly expanded; spermathecal heads situated anteriorly; spermathecal bases rounded, widely separated; spermathecal stalks short, widely separated.

Distribution and habitat: Known only from the type locality. The spiders inhabit moist evergreen hill forests above 2000 m elevation.

## Draconarius subulatus sp. n.

Figs 21-23
Type locality: THAILAND, Chiang Mai Province, Chomthong District, Doi Inthanon National Park, Doi Inthanon.

Type material: Holotype: ठ̄, 2510 m, pitfall trap, 25.v.-27.vi.2000, leg. P. Dankittipakul \& S. Sonthichai (MHNG).

Etymology: The specific name refers to the pointed patellar apophysis of the male.
Diagnosis: This new species can be easily recognized by the finger-like, pointed patellar apophysis and the long, spiral, posteriad-directed conductor in the male.

Description: ơ (holotype). Total length 10.51 . Carapace 5.44 long, 3.88 wide. Abdomen 5.11 long. Promargin and retromargin of chelicerae each with 3 teeth. Labium almost as long as wide ( $0.82 / 0.76$ ).

Eye sizes and interdistances: AME 0.17, ALE 0.23, PME 0.20, PLE 0.23; AMEAME 0.16, AME-ALE 0.17, PME-PME 0.10, PME-PLE 0.23, ALE-PLE 0.10 ; MOQ 0.63 long, anterior width 0.51 , posterior width 0.56 . Clypeus height 0.23 . Leg formula: 4-1-2-3.
 palp, ventral $(15,17)$ and retrolateral (16) view. Epigynum, ventral view (18). Vulva, dorsal view $(19,20)$. Scale lines 0.5 mm .


Figs 21-23
Draconarius subulatus sp . n., ô holotype. Left palp, ventral (21), retrolateral (22) and prolateral (23) view. Scale lines 1.0 mm .

Leg measurements:

|  | I | II | III | IV |
| :--- | ---: | ---: | ---: | ---: |
| Femur | 5.36 | 4.94 | 4.57 | 5.78 |
| Patella + Tibia | 6.84 | 5.78 | 5.10 | 6.05 |
| Metatarsus | 5.63 | 5.00 | 4.78 | 6.31 |
| Tarsus | 3.15 | 2.89 | 2.36 | 2.89 |
| Total | 20.98 | 18.61 | 16.81 | 21.03 |

Palp (Figs 21-23; expanded): Patellar apophysis large, finger-like, with sharp, pointed apex; RTA as long as tibia; retrolateral dorsal tibial apophysis small; cymbial furrow short; conductor long and spiral, proximad-directed; dorsal apophysis of conductor large; median apophysis spoon-shaped; embolus slender, originating proximally.
१. Unknown.

Distribution and habitat: Known only from the type locality. The type specimen was collected from moist evergreen hill forest near the summit of Doi Inthanon, where also D. inthanonensis sp. n. and D. siamensis $\mathrm{sp} . \mathrm{n}$. occur.

Coelotes Blackwall, 1841
Diagnosis: Males of Coelotes resemble those of Eurocoelotes Wang, 2002 in possessing a dorsal apophysis on the conductor and a rounded median apophysis, but can be distinguished by the presence of a broad patellar apophysis. Females of this
genus also resemble Eurocoelotes, but differ in having laterally situated epigynal teeth, a reduced genital atrium and shorter copulatory ducts.

Coelotes hui nom. n.
Remark: Coelotes hui nom. n. is a replacement name for C. wangi $\mathrm{Hu}, 2001$ : 133, figs 44.1-3 ( 9 holotype and 29 paratypes from Linzhi, Tibet, China, deposited in Shandong University, Jilian, China, not examined), which is a junior homonym of $C$. wangi Chen \& Zhao, 1997.

## Coelotes thailandensis sp. n .

Figs 24-25
Type locality: THAILAND, Chiang Rai Province, Wiang Papao District, Khun Jae National Park, Doi Lanka, Mae Toh waterfall, 1200 m .

Type material: Holotype: ${ }^{\text {ot, }}$, 15.x.2002, leg. P. Dankittipakul \& S. Sonthichai (MHNG).
Etymology: The specific name refers to the type locality.
Diagnosis: This new species is similar to C. pseudoterrestris Schenkel, 1963 but can be distinguished by the short conductor and the reduced retrolateral dorsal tibial apophysis of the male.
 Abdomen 5.56 long. Promargin of chelicerae with 2 teeth, retromargin with 4. Labium slightly longer than wide (0.79/0.71).

Eye sizes and interdistances: AME 0.15, ALE 0.23, PME 0.17, PLE 0.20; AMEAME 0.12, AME-ALE 0.12, PME-PME 0.14, PME-PLE 0.25, ALE-PLE 0.05 ; MOQ 0.56 long, anterior width 0.46 , posterior width 0.48 . Clypeus height 0.25 . Let formula: 4-1-2-3.

Leg measurements:

|  | I | II | III | IV |
| :--- | ---: | ---: | ---: | ---: |
| Femur | 5.89 | 5.26 | 5.00 | 6.31 |
| Patella + Tibia | 7.36 | 6.15 | 5.68 | 7.47 |
| Metatarsus | 6.10 | 5.26 | 5.26 | 7.10 |
| Tarsus | 3.42 | 2.89 | 2.47 | 3.15 |
| Total | 22.77 | 19.56 | 18.41 | 24.03 |

Palp (Figs 24-25): Patellar apophysis large; retrolateral tibial apophysis relatively long, with strong distal end; retrolateral dorsal tibial apophysis absent; cymbial furrow short; conductor short; dorsal apophysis of conductor larger than conductor; median apophysis short, rounded; embolus slender, originating prolateral-proximally.

Distribution and habitat: Known only from the type locality. The specimen was collected from a rotten $\log$ in an evergreen hill forest.

## ZOOGEOGRAPHY

Although various authors have brought together considerable information on the spider fauna of Thailand, the occurrence of the family Amaurobiidae there has never been mentioned before. This is the first record of amaurobiid spiders from that country.


Figs 24-25
Coelotes thailandensis sp. n., ô holotype. Left palp, ventral (24) and retrolateral view (25). Scale lines 1.0 mm .

Draconarius has previously been recorded from Central and East Asia (Ovtchinnikov, 1999; Wang, 2002). The present study expands the known distribution of Draconarius towards the southeast and provides a better understanding of the actual geographical range of this genus.

The genus Coelotes is widely distributed in the temperate zone of Europe, Central and East Asia. The new species described from Thailand is possibly restricted to high altitudes of mountainous areas. Distribution of this genus in Thailand is not clear since only a single species is reported here in this study. Additional observations are required.

The syntopic occurrence of three congeneric species (Draconarius inthanonensis sp. n., D. siamensis sp. n. and D. subulatus sp. n.) near the summit of Doi Inthanon is remarkable and underlines the high biodiversity of this mountain, where tropical and subtropical/temperate faunal and floral elements meet.

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## REFERENCES

Chen, J. \& Zhao, J. Z. 1997. Four new species of the genus Coelotes from Hubei, China (Araneae, Amaurobiidae). Acta Arachnologica Sinica 6(2): 87-92.
Hu, J. L. 2001. Spiders in Qinghai-Tibet Plateau of China. Henan Science and Technology Publishing House, 658 pp.
Ovtchinnikov, S. V. 1999. On the supraspecific systematics of the subfamily Coelotinae (Araneae, Amaurobiidae) in the former USSR fauna. Tethys Entomological Research 1: 63-80.
Platnick, N. I. 2003. The world spider catalog, version 3.5. American Museum of Natural History, online at http://research.amnh.org/entomoiogy/spiders/catalog81-87/index.html
Schenkel, E. 1963. Ostasiatische Spinnen aus dem Muséum d’Histoire naturelle de Paris. Mémoires du Muséum national d'Histoire naturelle, Paris (A, Zoologie) 25: 1-481.
Wang, J. F., Yin, C. M., Peng, X. J. \& Xie, L. P. New species of the spiders of the genus Coelotes from China (Araneae: Agelenidae). In: Spiders in China: One Hundred New and Newly Recorded Species of the Families Araneidae and Agelenidae. Hunan Normal University Press, pp. 172-253.
WANG, X. P. 2002. A generic-level revision of the spider subfamily Coelotinae (Araneae, Amaurobiidae). Bulletin of the American Museum of Natural History 269: 1-150.

